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ABSTRACT

Vision problems occur at higher rates in the deaf and hearing impaired population than in the general population. When an individual has a hearing impairment, vision becomes more significant in the instructional and learning process, as well as in social and communicative exchanges. Regular comprehensive visual screening of hearing impaired students is important. The Nevada Dual Sensory Impairment Project is a statewide initiative to screen the vision of students with hearing impairments. Procedures were developed using input from a statewide advisory committee, and the project was piloted in six schools with children ranging from age 3 to middle school age. Following the pilot, the special education administrators of Nevada's school districts were presented with a rationale for the screening project, a project overview, and lists of the responsibilities of participating school districts and project staff. Sixteen of the state's 17 districts were willing to participate, but for various reasons, screenings took place in only 10 districts. A total of 176 students from 35 schools were screened. In the six areas of vision tested, 99 instances of visual impairment were found, with some students receiving multiple referrals or recommendations. Recommendations about classroom accommodations for visual impairments were made to teachers, some of whom were unaware of certain types of visual conditions. Brief descriptions of the six screening procedures are included. (SV)

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SCREENING FOR VISION PROBLEMS IN CHILDREN WITH HEARING IMPAIRMENTS

Importance of Screening for Vision Problems

Vision and hearing are the two primary senses by which we learn. When one of these senses is impaired, the other sense assumes an even more significant role in an individual's learning. Vision problems occur at a greater incidence in the deaf population than in the general population (Prickett & Prickett, 1992). In particular, individuals with hearing impairments may be more at risk for syndromes or conditions in which vision is affected. One specific syndrome that results in a vision loss for individuals who are hard of hearing or deaf is Usher syndrome, a genetic disorder in which hearing loss generally occurs at birth or shortly thereafter. A progressive loss of vision due to retinitis pigmentosa (a degeneration of the retina of the eyes) begins later in life, usually before adolescence. Approximately 3-6% of the hard of hearing population and 3-6% of the deaf population are estimated to have Usher syndrome. In addition to this syndrome, there are numerous other conditions that increase the possibility that individuals who are hard of hearing or deaf might also have impaired vision.

When an individual already has a diagnosed hearing impairment, vision becomes much more significant in the instruction and learning process as well as more important in social and communicative exchanges. Early identification of visual impairments for those individuals who are hard of hearing or deaf can help the individual, family, and teacher to acquire the information needed to appropriately meet the individual's needs.

Because most teaching methods used in the education of students who are hard of hearing or deaf rely upon those students having good vision, teachers often need to adapt instructional methodologies. Unfortunately, teachers of students who are hard of hearing or deaf frequently do not have the training or information needed to teach those students who have additional visual impairments (Prickett & Prickett, 1992). Often specific information can be provided to these teachers and adaptations that address the vision impairment can easily be incorporated into educational settings. At times students may need to have corrective lenses prescribed or may need to be encouraged to wear glasses they already have. Some students will need to wear corrective lenses for all activities and others will need glasses only for close work such as reading. It is important that the teachers of students who are hard of hearing or deaf understand the specific educational implications for those students who also have visual impairments. Such information can help the individual, parents, and teachers better plan for education, vocational experiences, and career planning taking into account the combined hearing and vision losses. Additionally, appropriate related educational services can be provided (e.g., orientation and mobility). Addressing the combined vision and hearing loss, can increase the effectiveness of instruction for these students

Given the importance of vision for students who are hard of hearing or deaf and the increased incidence of vision problems among these individuals, it is important that comprehensive screening for vision problems occurs regularly for these students. The purpose of this project is to discuss a statewide initiative to screen vision and related areas of students already identified with hearing impairments.

Screening Project Description

The Nevada Dual Sensory Impairment Project, a statewide technical assistance project funded by the U.S. Department of Education, Office of Special Education Programs, initiated this statewide screening project. Prior to implementing the screening project, we drafted procedures and had them reviewed by the Nevada Dual Sensory Impairment Project Advisory Committee. Important input from the Advisory Committee included suggestions regarding (a) the format of the parent/guardian permission forms, (b) the parent and teacher cover letters, (c) development of a fact sheet highlighting the importance of screening vision for students with hearing impairments, and (d) strategies to be in place regarding referrals. After these suggestions were implemented, we approached a local school district to pilot the procedures.

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Pilot Project

We piloted the project with 40 children in seven classrooms located in six different schools. These children ranged in age from preschool (one student turned 3 years old the day we were screening) to middle school age. The pilot project assisted us in determining needs as well as strengths prior to moving to the statewide initiative. For example, we were praised for patience displayed with the children (especially the younger children), providing written feedback for the school and families, and the "smoothness" with which the screening was conducted. However, we also gained important information about the size of the room needed, the need to have duplicate screening materials on hand, and the need to compile packets that followed the student from station to station rather than having individual forms at each station.

Beginning the Statewide Initiative

In Nevada, the special education administrators have regular meetings facilitated by the Nevada Department of Education. Early in the school year we presented at one of the administrator meetings to solicit administrator agreement to participate, district contact information, and potential dates for the district. To gain administrator agreement we presented them with (a) a brief rationale for the screening project, (b) school district commitment (see Table 1), (c) Nevada Dual Sensory Impairment Project commitment (see Table 1), (e) screening project overview (see Table 1), (f) general discussion of screening project stations (see Table 2), and (g) potential benefits of participating.

Table 1
School District Commitment, Project Commitment, and Screening Overview

SCHOOL DISTRICT COMMITMENT	NEVADA DUAL SENSORY IMPAIRMENT PROJECT COMMITMENT	SCREENING PROJECT OVERVIEW
1. Indicate interest or agreement in participating	1. Provide permission forms and questionnaires	1. Obtain parent / guardian permission
2. Notify relevant teachers and school nurses	2. Provide materials for the screening stations	2. Parents / caregivers complete questionnaires identifying behavioral indicators and potential hereditary indicators
3. Have teachers send packets prepared by project to parents or caregivers	3. Invite school nurses and others to participate as requested by the district	3. Teachers complete questionnaires identifying behavioral indicators
4. Have teachers complete behavioral indicators checklist for each student	4. Provide people to conduct each station	4. Complete screening stations at the school site
5. Ensure space for the screening stations (i.e., one dark room and a large room)	5. Summarize the results for each student	
	6. Send the results to the school nurse and/or teacher (with an extra copy for the family)	
	7. Provide follow-up assistance as requested	
	8. Provide guidelines for sites to replicate the process	

Table 2
Overview of Screening Station Procedures and Materials

SCREENING STATION	MATERIALS	PROCEDURES
Color Vision	*Pseudo-Isochromatic Plates for Testing Color Vision* Good-lite P.O. Box 387 Steamwood, IL 60107 1-800-362-3860 http://www.good-lite.com/	Students can either trace trails or read numbers.
Near Vision	*LH Symbol Tests* Lighthouse Low Vision Products 36-02 Northern Boulevard Long Island City, NY 11101 1-800-453-4923	1. Follow the directions that accompany the test. 2. Begin with binocular testing and then move to each eye separately. 3. Record acuity.
Distance Vision	*Single Symbol Book* Precision Vision 944 First Street La Salle IL 61301 815-223-2022	1. Follow the directions that accompany the test. 2. Begin with binocular testing and then move to each eye separately. 3. Record acuity.
Visual Field	No materials needed	*Wiggling Fingers Test*: 1. Position one person behind the child and one in front of the child. 2. Ask the child to look straight ahead at the person's nose and to tell the person when she sees the wiggling fingers. 3. Document the point at which the student could first see the fingers. 4. Repeat for both horizontal and vertical planes.
Balance	No materials needed	Conduct both tests. *Feet Together:* 1. Student stands feet together, arms stretched out, eyes open. 2. Examiner stands behind and gently pushes on either side of student's torso. Repeat as needed. 3. Repeat with eyes closed. 4. Document. *One Foot in Front of Other:* 1. Student stands one foot in front of other, arms stretched out, eyes open. 2. Examiner stands behind and gently pushes on either side of student's torso. Repeat as needed. 3. Repeat with eyes closed. 4. Document.
Dark Adaptation	*Cone Adaptation Test* Vision Associates 7512 Dr Phillips Blvd. #50-316 Orlando, FL 32819 407-352-1200	1. As a practice test with the lights on, mix the squares on a dark table or carpet and ask the student to sort them into 3 groups: red, white, and blue. 2. Dim the lights to simulate twilight or dusk. Ask the child to sort the squares. Document the time and number of squares sorted correctly.

Results of Statewide Screening Project

Sixteen of the 17 districts in the state indicated their willingness to participate in this screening project. However, four rural districts did not have any children identified as having hearing impairments. A fifth district sent their students to a neighboring district to receive services and thus would receive the opportunity to participate in the screening in that district. A sixth district agreed to participate but no parental permission forms were returned and so we were unable to complete any of the screening procedures with the students in that district. Thus, a total of 10 districts scattered throughout Nevada participated in the screening project. Within these 10 districts we screened a total of 176 students from 35 different schools. Table 3 provides an overview of the number of schools, students, and visits for each district.

Table 3
Overview of Number of Schools, Students, and Visits

School District	Number of Schools We Visited	Number of Students Screened	Number of Visits to Each District
District 1	5	19	3
District 2	3	7	2
District 3	4	88	5
District 4	Students brought to campus	2	Students brought to campus—2 visits
District 5	2	2	1
District 6	2	2	1
District 7	Students brought to central location	13	1
District 8	1	1	1
District 9	2	2	1
District 10	6	40	8

The number of students who had difficulty in completing aspects of the screening is as follows:

Color Vision:	2 students
Near Vision:	30 students
Distance Vision:	44 students
Visual Field:	5 students
Balance:	18 students
Dark Adaptation:	0 students

Please note that that one student could be referred or receive recommendations for more than one area (e.g., near vision and distance vision).

Discussion

As can be seen from the number of students listed above, a substantial number of students screened had difficulties in passing the screening tests. These screening tests cannot be considered as a definitive tests for visual impairments. However, a large number of these students were referred to an eye care professional. For other students, teachers benefited from recommendations about how to make accommodations for a documented visual condition. For example, one student had 20/20 vision in one eye; however, he was legally blind in the other eye, even with correction. Although this student does not technically qualify as a student with a visual impairment, his visual condition obviously has implications for classroom instruction. As was the case for this specific student, we discovered that many teachers did not even know of these types of visual conditions. In other instances we were

told that students had corrective lenses at one time and that they were lost or that it was thought they were no longer needed. In some cases, students had their eyeglasses with them and we were able to screen both without and with the glasses. In each instance where the student thought that he or she no longer needed to wear eyeglasses, the student actually passed the screening wearing the glasses (when they would have failed without them). In these instances, we were able to promote the importance of the eyeglasses to the student, family, and teacher.

Obviously, potential benefits of a screening project such as this one are numerous. Perhaps the most important benefit is that students who already have an impairment in one of the most important senses for learning (i.e., hearing) and who do not pass the screening will be referred to an eye care professional. As a result of an in-depth examination by an eye care professional, appropriate recommendations can then be made for the student. Some students might need corrective lenses as well as specific accommodations in the classroom. Others will need only corrective lenses. Still others might find out that they have a progressive visual condition. A progressive visual loss can be particularly difficult for students. These students may adapt to the loss as the deterioration gradually occurs, not even realizing that they have a vision problem. Some students identified with a progressive loss have reported that they thought everyone saw the way they did; they did not know their vision was different. For students with a progressive loss, a key benefit of a screening project is the follow-up training and technical assistance that the team can access.

As students, families, and teachers become aware of the importance of vision for those who already have a hearing impairment, all can be sensitive to indicators of the need to have vision checked. Subsequently, accommodations can be made to meet the students' needs so that they are receiving an appropriate education.

Reference

Prickett, H. T., & Prickett, J. G. (1992). Vision problems among students in schools and programs for deaf children. American Annals of the Deaf, 137, 56-60.

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